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DESCRIPTION OF
SOME JUVENILE HOMINID SPECIMENS
FROM SWARTKRANS, TRANSVAAL

By

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Cape Town Kaapstad

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By

F. E. GRINE

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(With 15 figures)

[MS accepted 12 May 1981]

ABSTRACT

Recent work on the hominid fossils from Swartkrans revealed several juvenile specimens which required cleaning and description. Four such specimens, representing the gnathic and/or dental remains of three 'robust' australopithecine individuals, have been prepared and described in detail. The specimens, SK 839/852, SK 1595, and SK 2147 have added a number of deciduous and permanent teeth to the collection from this site.

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INTRODUCTION

Since 1948, when Robert Broom and J. T. Robinson began working at Swartkrans, the fossiliferous deposits of this cave system have yielded an abundance of hominid remains, including a number of juvenile specimens.

Geological and palaeontological investigations have demonstrated that the Swartkrans deposit consists of older and younger sediment groups (Brain 1958, 1976; Cooke 1963, 1978; Brain, Vrba & Robinson 1974; Hendey 1974; Vrba 1975; Butzer 1976). Butzer (1976) and Brain (1976) have defined the older breccias as Member 1 and the younger breccias as Member 2 of the Swartkrans Formation.

The first hominid specimens recovered from the Swartkrans Formation were attributed to a new taxon, *Paranthropus crassidens*, by Broom (1949). The vast majority of hominid specimens which have been found at Swartkrans (over 95% of individuals) have been referred to this taxon under a variety of names, viz. *Paranthropus crassidens*, *P. robustus*, *Australopithecus crassidens*, *A. robustus*, and *A. robustus crassidens*. Geological studies have shown that these australopithecine remains are derived from the Member 1 sediments (Brain 1976, 1978).

The existence of individuals of the genus *Homo* in the Swartkrans deposit has been well substantiated (Broom & Robinson 1949, 1950, 1952; Robinson 1953a, 1953b, 1961; Tobias 1968, 1978; Clarke, Howell & Brain 1970; Clarke & Howell 1972; Wallace 1972, 1975; Clarke 1977a, 1977b; Olson 1978). The first specimen referable to *Homo* to be found at Swartkrans was the mandible SK 15 (Broom & Robinson 1949, 1950). The jaw was found in a pocket of brownish breccia surrounded by the typically pink Member 1 sediments, and it was initially thought that SK 15 was younger than the australopithecine remains (Broom & Robinson 1949, 1950). Later, however, Robinson (1953b) considered that the brown breccia encasing the mandible was a pocket of decalcified primary breccia and that SK 15 and the australopithecine remains were coeval. More recent work has demonstrated that the brown breccia is, indeed, younger than the australopithecine-bearing Member 1 sediments (Brain, Vrba & Robinson 1974; Brain 1976, 1978).

Three other hominid specimens, a P₃ (SK 18a), a proximal radius (SK 18b), and the buccal moiety of a P₄ (SK 43), were recovered from within the same pocket of Member 2 breccia as the SK 15 mandible. These four specimens have been referred to the same taxon (Broom & Robinson 1950, 1952; Robinson 1953b; Tobias & Wells 1967).

Several specimens attributed to *Homo* (e.g. SK 45, SK 847, SK 27, and SK 2635) have been recovered from the australopithecine-bearing Member 1 breccia. As noted by Clarke (1977a), there is little morphological basis for assuming that the *Homo* specimens from Members 1 and 2 belong to the same specific taxon. On the other hand, it is generally accepted that the australopithecine remains from Swartkrans are representative of a single, species-specific taxon (Broom & Robinson 1952; Robinson 1956; Tobias 1967; Wallace 1972; Clarke 1977a; Howell 1978).

Recent work on the hominid fossils from Swartkrans revealed several juvenile specimens which required cleaning, reconstruction and description. Four such fossils are dealt with in this paper. The specimens consist generally of small gnathic fragments with variously preserved deciduous and permanent teeth. The fossils are catalogued in the Transvaal Museum as SK 839, SK 852, SK 1595, and SK 2147, and all are derived from Member 1 breccias.

Each specimen will be described as follows: (i) the data presented on the relevant museum catalogue card, (ii) a brief statement of preservation prior to cleaning and reconstruction, and (iii) a detailed morphological description of the specimen after restoration.

All measurements recorded here were taken by the author, unless stated otherwise. The dental measurements were taken to 0,1 mm accuracy with a dial-equipped sliding vernier caliper.

MATERIAL AND DESCRIPTIONS

SPECIMEN SK 839

This specimen was excavated from Member 1 breccia by J. T. Robinson in 1952. The description on the catalogue card reads: 'Fragmentary juvenile maxilla containing some deciduous and permanent teeth some of which have suffered considerable damage.'

Prior to restoration, this specimen consisted of isolated, incompletely developed and slightly damaged LM¹ and RM¹, isolated and slightly damaged Rdm² and the distal two-thirds of the R $\dot{d}m^1$. In addition, the badly damaged permanent incisors, the damaged Rdi¹, the root of the Ldi¹, and a small bit of the alveolar portion of the maxilla were preserved in a piece of breccia (Fig. 1).

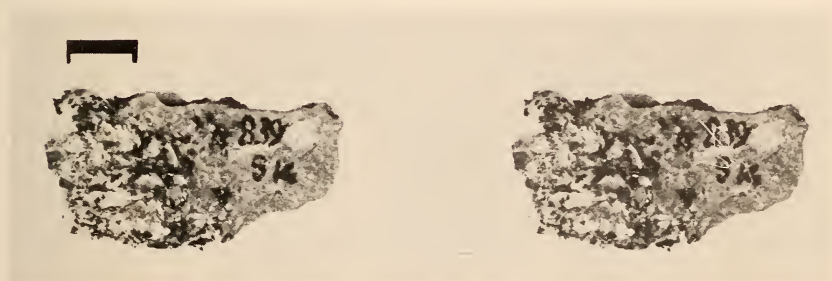


Fig. 1. Stereoview of the maxillary central deciduous and central and lateral permanent incisors of SK 839 prior to preparation. Compare with Figures 2-5. Scale in cm.

The crown of the Ldi¹ was found in a box with another, unrelated, hominid specimen from Swartkrans. The two deciduous central incisors and the four permanent incisors were cleaned, reconstructed and strengthened by the author.

Deciduous dentition (Figs 2-4)

Maxillary central deciduous incisors

The damaged crowns and roots of both incisors are present. The crown of the Ldi¹ is only moderately well preserved; the distolingual quadrant is missing and the remaining lingual portion is separated from the buccal part by a narrow crack. The buccal surface is displaced somewhat by virtue of breaks on either side of a 0,7 mm wide vertical sliver of enamel. The crown of the Rdi¹ is better preserved, with small pieces of both the mesial and distal edges missing. The roots of both teeth are poorly preserved; the lingual sides of both are missing just beyond the cervical lines, and the buccal surfaces are covered by remnants of the alveolar portion of the maxilla.

Occlusal wear is moderate in degree, with some reduction of crown height; most of the lingual aspect comprises a lingually sloping and slightly mesiodistally concave dentine exposure. The buccal edge of this surface is rather sharp and comprises a thin wall of enamel. Lingually, the remaining enamel surface shows slight faceting. Interproximal attrition is moderate on the mesial face, with dentine exposed on the incisal aspect of this surface; distally, interproximal wear appears to be slightly less severe. Neither crown shows any perikymata, but on the buccal surface of the Ldi¹ there is a rather large hypoplastic area (MD, 1,0 mm; height, 0,6 mm) surrounded by several smaller pits, whilst on the Rdi¹ a considerably smaller, single hypoplastic pit is evident.

The buccal aspect of the crown appears to have been square in outline before wear. There is no cervical enamel prominence, and this surface is nearly flat and disposed vertically incisocervically. Wear and damage to the incisolingual aspect of the crowns have obliterated any morphology that might have been present.



Fig. 2. Lingual view of the maxillary central deciduous incisors; and occlusal view of the Rdm¹ and Rdm² of SK 839. Scale in cm.

Robinson (1956: 122) recorded the existing mesiodistal diameters of both crowns as 5,7 mm and noted that, because of the appreciable degree of incisal and interproximal wear, the original dimensions 'must have been about a millimetre greater'. The author agrees with Robinson that about 0,5 mm of dental material has been lost from either side of each crown. The dimensions of these teeth recorded by the present author are as follows:

	MD diameter (as measured)	MD diameter (estimated)	BL diameter (estimated)
Ldi ¹	5,7 mm	6,7 mm	5,2 mm
Rdi ¹	5,8 mm	6,8 mm	5,2 mm

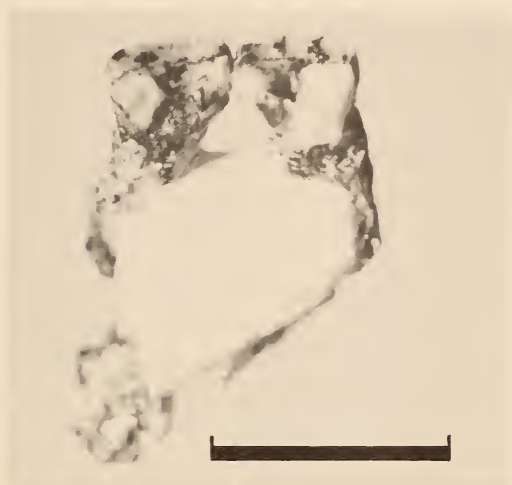


Fig. 3. Oblique incisolingual view of the maxillary deciduous central incisors of SK 839, showing type of wear. Scale in cm.

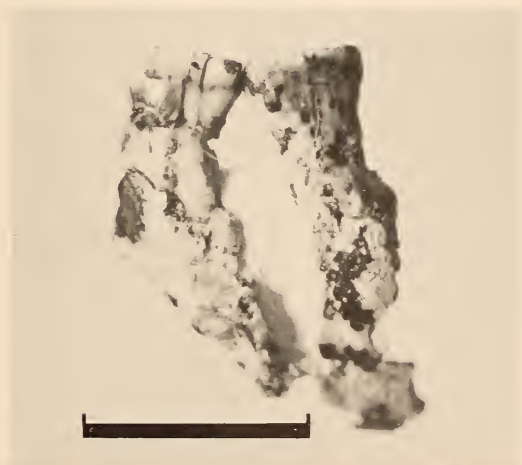


Fig. 4. Buccal view of maxillary central deciduous incisors and the attached alveolar bone of SK 839. Scale in cm.

Maxillary first deciduous molar

The distal two-thirds or more of the right crown is preserved. The portion of the crown that is missing has been broken away along a line which runs obliquely buccolingually from a point apparently just behind the tip of the paracone, through the protocone to the level of the lingual developmental groove. A slight crack runs distally from the paracone, through the tip of the metacone where it bifurcates, one limb courses distobuccally, whilst the other divides the distal marginal ridge. The mesiobuccal root is missing, and the lingual root has been broken away from the crown with the cervical enamel margin. The distobuccal root is preserved for what appears to be most of its length. It is evident that buccally the neck of the radicular system was rather low, there being less than 1 mm of cementum exposed between the cervical enamel margin and the point of bifurcation of the two buccal roots. The distobuccal root, as preserved, slopes away from the crown both distally and very slightly buccally. The root is straight and the apical end appears to taper slightly.

It is evident that all four principal cusps—paracone, metacone, protocone and hypocone—were present. The size of the paracone cannot be determined accurately, but it seems to have been approximately the same size as, or perhaps slightly smaller than, the metacone. The protocone was apparently the largest cusp. The hypocone and metacone are almost the same size. Occlusal wear is moderate and has produced two bevelled surfaces. Mesially, the protocone has been worn flat and a moderately large, concave dentine island is exposed. The protocone is worn slightly below the level of the paracone, which appears to have shown a very small dentine exposure. The distal portion of the occlusal surface slopes distolingually; a moderate-sized, concave dentine island is exposed on the hypocone, while no dentine is shown on the metacone. Interproximal attrition appears to have been slight to perhaps moderate in degree. The distal contact facet, which measures approximately 3,1 mm buccolingually by 2,1 mm in height, is ovoid in outline and flattened. It is located, for the most part, behind the hypocone, while the corresponding facet on the dm^2 is situated over the buccal half of its mesial face.

The buccal face, as preserved, shows no cervical prominence or swelling, and it is faintly convex occlusocervically. There is no trace of a buccal groove. The cervical margin of the lingual face is not preserved, but this surface—over the hypocone—is more convex than the buccal surface. The lingual groove is very shallow and short.

The protocone and paracone appear to have been separated by a very shallow, narrow groove. The trigon basin is represented by a short and narrow but oblique groove. The distal trigon crest is narrow but continuous. The distal marginal ridge is thick and high, extending without any apparent interruption from behind the tip of the metacone to the hypocone. The talon basin, or fovea posterior, is represented by a crescent-shaped, relatively deep groove.

It is not possible to record any crown diameters for this tooth.

Maxillary second deciduous molar

The crown of the right tooth is preserved. It is very nearly complete; the cervical margin has been damaged round the entire periphery save for the buccal aspect. A large, vertical sliver of enamel has broken away from the mesial face, and the distobuccal corner of the crown has been displaced slightly. Several narrow cracks traverse the crown. The radicular system has been broken away save for a short segment of the mesiobuccal root.

Viewed from the occlusal aspect, the crown is square in outline. All four principal cusps are present and well developed. The protocone is by far the largest cusp, followed by the metacone and the paracone, the latter being slightly smaller. The hypocone is well developed and is approximately the same size as the metacone. Occlusal wear is slight, and has reduced the cuspal tips to nearly the same height. Wear is heaviest on the protocone, which shows large enamel facets but only a tiny pit of exposed dentine. Small dentine exposures are displayed also by the metacone and paracone. Generally, the mesial portion of the crown has been worn more heavily than the distal part. Interproximal contact with the dm^1 appears to have been slight, while no distal contact facet is present.

The mesial marginal ridge is thick and well developed and, though worn, it appears to have coursed without interruption from the front of the paracone to the protocone. Distal to the mesial marginal ridge, the fovea anterior is represented by a short, narrow groove which is completely enclosed distally by a short and thin but continuous epicrista. The epicrista runs parallel to the mesial marginal ridge. The trigon basin is broad and rather deep, its floor being represented by a triradiate groove. The distal trigon crest is moderately well developed but is incised and thinned in its middle by a narrow but deep groove. The distal marginal ridge is moderately thick and high and runs without interruption from the metacone to the hypocone. It is slightly lower in its middle, with two faint grooves on its mesial aspect; it runs continuously, high up on to the metacone. The talon basin is represented by a deep, broad groove which runs obliquely between the hypocone and protocone to incise the lingual surface of the crown.

The buccal surface is rather flat and vertically disposed over the upper third of its height, and is slightly swollen and convex over the cervical two-thirds. There is no distinct cervical enamel prominence, and the cervical enamel line courses, for a short distance, towards the bifurcation of the two buccal roots. The buccal groove is rather weakly expressed; it is broad but very shallow towards its occlusal end, and courses cervically for less than half of the height of the crown where it terminates gradually. A number of very small hypoplastic pits cover the buccal face around both the occlusal and cervical extremities of the buccal groove.

The lingual surface is more convex than the buccal, and curves in a continuous arc from the occlusal margin to the cervical line. The cervical enamel margin is missing, but it appears that no pronounced prominence was

present. The lingual groove is deep and broad over most of its course, but terminates gradually approximately half-way towards the cervical margin. There is no trace of a Carabelli trait. The protocone is ringed on its mesial and lingual aspects by a thin band of numerous, tiny, hypoplastic pits. This band is situated near the occlusal surface.

The radicular system is represented solely by a short segment of the mesiobuccal root. In so far as it is preserved, it courses slightly mesialward and is considerably broader in its buccolingual than in its mesiodistal dimension. It appears that the radicular neck was low.

Robinson (1956: 128) recorded the mesiodistal and buccolingual diameters of this crown as 10,5 mm and 11,4 mm respectively. The measurements obtained by the present author are as follows:

	MD diameter (as measured)	MD diameter (estimated)	BL diameter (as measured)
Rdm ²	10,7 mm	10,8 mm	11,5 mm

Permanent dentition (Fig. 5)

Maxillary central permanent incisors

The left and right maxillary central incisors are represented. Both teeth consist of rather badly damaged crowns only. They are unerupted. A root is not present.

The crowns were badly crushed and broken in preservation, and both have been reconstructed from several different pieces. The left crown is crushed and the central and distal regions of the lingual surface have been displaced. The mesial, buccal and distal surfaces have suffered considerable loss of enamel about the cervical margin. The mesiobuccal quadrant of the left crown is missing, and the mesial end of the lingual surface has suffered slight crushing.

The mesial end of the incisal edge is slightly rounded, while the distal extremity of this edge shows a broad curvature. The incisal edge comprises large mesial and distal mammelons and a considerably smaller and lower median mammelon. Viewed from the buccal aspect, the crown is judged to have had a tapered outline, the cervical region having been narrower than the incisal portion. The buccal surface is gently convex incisocervically. Neither tooth exhibits either perikymatous or hypoplastic enamel.

Lingually, there is a moderate cervical enamel swelling which appears to have been symmetrically disposed. The mesial marginal ridge is much more pronounced, and a relatively narrow, low median ridge projects vertically from the cervical enamel prominence towards the incisal edge. The lingual surface is slightly concave over the upper half of the crown, both incisocervically and mesiodistally.

	MD diameter (as measured)	MD diameter (corrected)	BL diameter (corrected)
LI ¹	8,2 mm	8,6 mm	—
RI ¹	8,6 mm	8,6 mm	6,8 mm

Maxillary lateral permanent incisors

The crown of the right tooth is well preserved, with only slight damage to parts of the cervical enamel margin. The crown of the left tooth is severely crushed and distorted and, because the right crown is so well preserved, it was deemed unnecessary to attempt a reconstruction of its antimere.

The tooth is unerupted. There is no root present. The crown appears to be completely developed.

The mesial end of the incisal edge is gently rounded, while the distal extremity is slightly lower than the mesial and is more broadly rounded. The incisal edge is gently rounded and rather smooth; there is no mammelon development.

Viewed from the buccal aspect, the crown has a tapered outline, with the cervical region narrower than the incisal portion. The buccal surface is slightly convex incisocervically, with a faint, broad, flattening in the centre of this surface over the upper half. This area is bounded both mesially and distally by faint ridges that course from the cervical region to the respective corners of the incisal edge. The distal side of this face displays several faint perikymatous ridges; there is no evidence of hypoplastic enamel.

Lingually, the cervical region shows a slight swelling. The mesial marginal ridge is slightly developed, the distal marginal ridge is moderately well developed and there is no median ridge present. The mesial and distal marginal ridges converge cervically to blend into the cervical swelling. The lingual surface is slightly concave, especially mesiodistally.

	MD diameter (as measured)	BL diameter (as measured)	Height (as measured)
RI ²	6,0 mm	5,5 mm	8,7 mm

Maxillary first permanent molars

The unerupted crowns of both the left and right maxillary first permanent molars are present. Both crowns have suffered from damage to the cervical enamel; generally, the right tooth is better preserved. The buccal side of the left crown is separated and displaced from the rest of the tooth by a crack which runs through the tips of the paracone and metacone. Nothing of the radicular system is present.

The two crowns are nearly identical in morphological detail (Fig. 5). Viewed from the occlusal aspect, the crown is nearly square in outline, with all four principal cusps present and well developed. The protocone is the largest cusp, followed by the paracone and metacone, which are nearly equal in size. The hypocone is the smallest cusp. The mesial marginal ridge is moderately thick; it is higher and thicker near the protocone where a moderate-sized protoconule is present. The protoconule is delineated on either side by shallow grooves. A short epicrista projects from the mesial end of the paracone and, although this crest is delineated on either side by deep, narrow grooves, there is



Fig. 5. Lingual view of the permanent incisors and occlusal view of the first permanent molars of SK 839. Scale in cm.

no anterior fovea present. The trigon basin is deep. The distal trigon crest is moderately thick, but is incised midway between the protocone and metacone by a relatively deep pit which is continuous with the deep, but narrow, groove between the protocone and hypocone. On the lingual surface this groove continues vertically for approximately half of the crown height, where it ends abruptly.

The lingual surface projects from the occlusal to the cervical margin; the cervical half of this face is slightly convex. The mesiolingual corner of the protocone presents two short, vertical grooves which are separated by approximately 2,7 mm of enamel. However, there is no alteration of the general curvature of this face. The Carabelli feature is represented by grooves. This feature is only slightly expressed on the left crown.

The buccal surface is less expanded than the lingual and is only faintly convex occlusocervically. The buccal groove is vertically deep and narrow and extends only over the upper third of the crown. It ends abruptly. Neither the buccal nor the lingual surface shows any indication of hypoplastic enamel.

Robinson (1956: 81) considered these crowns to be incompletely developed and recorded estimated, complete mesiodistal and buccolingual dimensions of 13,2 mm and 13,9 mm respectively. The present author agrees with Robinson that the crowns are immature, but he is unable to judge accurately how much, if any, additional increase in size would have been attained. The measurements of the crowns as recorded are as follows:

	MD diameter (as measured)	BL diameter (as measured)
LM ¹	12,5 mm	—
RM ¹	12,8 mm	14,0 mm

SPECIMEN SK 852

This specimen was excavated from Member 1 breccia by J. T. Robinson in 1952. The description on the catalogue card reads: 'Poor specimen of juvenile mandible with left dm_1 (broken); dm_2 , moderately worn; right dm_1 appreciably worn; dm_2 moderately worn and incomplete; and fragment of M_1 erupting.'

Prior to cleaning and restoration, this specimen consisted of an isolated and nearly complete Rd_c as well as the isolated, complete crowns of the LI_1 , LI_2 and $L\bar{C}$. The major part of this specimen consisted of the poorly preserved mandibular corpora with the roots of the Ldm_1 , the damaged Rdm_1 , Ldm_2 , Rdm_2 and the metaconid of the RM_1 , and the matrix-covered crown of the LM_1 (Fig. 6). The mandibular corpora were preserved in misalignment, and wedged

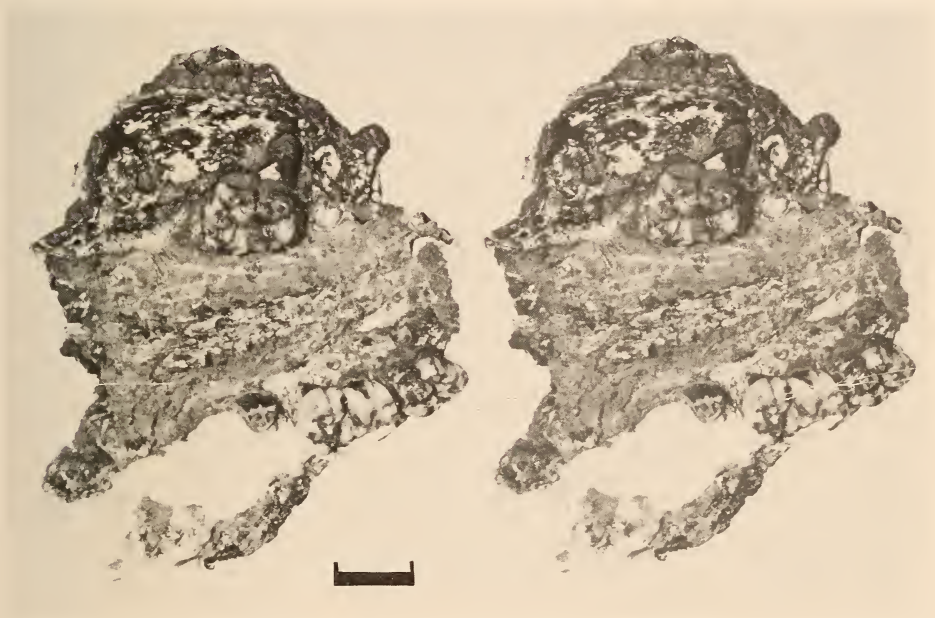


Fig. 6. Stereoview of the mandibular corpora and dentition of SK 852 prior to restoration. Compare with Figure 8. Scale in cm.

between them was a large piece of unidentified bone. The region of the RM_1 was covered in plaster. The two corpora were removed from the matrix and cleaned. In this process the hypoconid and hypoconulid of the RM_1 were discovered beneath the plaster; this piece of crown was reconstructed in correct anatomical position. The corpora and their contained teeth were cleaned and, where necessary, strengthened with plaster.

The mandibular corpora are poorly preserved, somewhat distorted and very incomplete. Meaningful descriptions or measurements for either of these are not possible (see Figs 8 and 10).

*Deciduous dentition (Figs 7-9)**Mandibular deciduous canine*

The right tooth only is present. It is reasonably well preserved with rather severe damage to the mesial portion of the crown, but the root is nearly complete with only the apical tip missing.

Enamel from the mesial and mesiolingual parts of the crown has been broken away. The tip is damaged also and a moderately wide vertical crack courses across the middle of the buccal surface.

Viewed from the buccal aspect, the crown is rather 'mitten-shaped' with a large primary cusp situated mesially and a small distal cusplid. The buccal surface is faintly convex incisocervically over the cervical third of the crown's height, and a cervical prominence is not present. The distal cusplid is worn, but there remains the trace of a short, faint vertical groove between it and the main cusp.

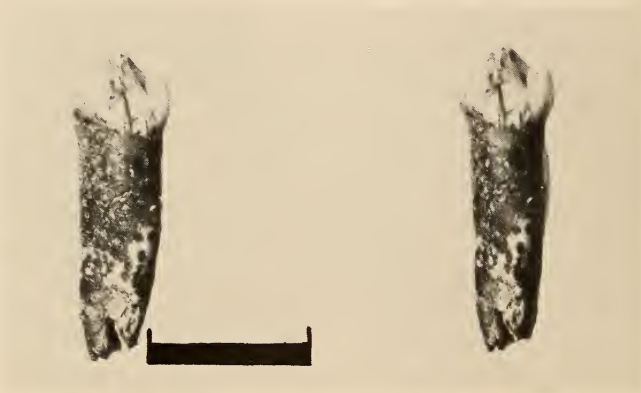


Fig. 7. Stereoview of the lingual aspect of the Rd_c of SK 852.
Scale in cm.

Lingually, there is a slight cervical prominence which is skewed distally. There are no tubercles supported by this prominence. The cervical enamel line courses downwards from mesial to distal. The mesial third of this surface has been damaged. A moderately deep, triangular-shaped groove separates the main cusp from the distal cusplid. A moderate enamel ridge courses from the tip of the distal cusplid downwards to blend into the cervical enamel prominence.

Occlusal wear is slight. A well-developed enamel facet is present along the distal slope of the main cusp and on the tip of the distal cusplid. This facet is narrow but highly polished, and it is continuous along the main cusp to a horizontal disposition on the distal cusplid. Dentine is not exposed. Interproximal attrition with the dm₁ was mild, with only a small, slightly flattened,

circular contact facet (0,7 mm diameter) near the top of the distal cuspid. The dimensions of the crown are as follows:

	MD diameter (as measured)	MD diameter (corrected)	BL diameter (as measured)	Height (estimated)
Rd _c	5,7 mm	5,9 mm	4,6 mm	6,5 mm

The root of this tooth is single. It has a flattened ovoid outline in cross-section, with the longer axis (5,1 mm) running from mesiobuccal to distolingual and the shorter axis (3,8 mm) running from mesiolingual to distobuccal. The root is rather straight and long. It is estimated that the original length was approximately 13,0 mm (measured length, 11,4 mm).

Mandibular first deciduous molars

The obliquely shorn-off roots of the left tooth and the somewhat damaged crown and roots of the right tooth are present. The right crown has suffered enamel loss along the entire distal surface, and the occlusal surface has a wide crack over the top of the hypoconid and metaconid. Two narrow, vertical cracks course across the buccal surfaces of the protoconid and hypoconid.

Viewed from the occlusal aspect, the crown has a somewhat irregular rectangular outline. The mesial end is slightly narrowed and projects anteriorly, while the distal end of the crown is broad and appears to have been flattened. The protoconid, hypoconid, metaconid, and entoconid are preserved. It appears that the hypoconulid was absent, or if it was present originally it is evident that it would have been very small. Wear and damage do not permit an accurate assessment of the relative cuspal sizes.

Occlusal wear is moderate, with considerable reduction and flattening of cuspal height. The occlusal surface has been worn so that a broad, rather flattened plane has been produced; this plane slopes slightly downward distally from the tips of the metaconid and protoconid. It appears that a small island of dentine was exposed on the top of the protoconid, while the metaconid shows a somewhat larger exposure. The top of the hypoconid is damaged, but it is evident that at least a moderately large dentine island was present. The entoconid is covered by a large, concave dentine basin. A second facet is present in front of the protoconid tip. This facet slopes downward mesially as a well-defined, polished enamel surface along the mesial marginal ridge.

Interproximal wear is judged to have been mild both mesially, as discussed above, and distally. Although the distal surface of the dm₁ is missing, the mesial surface of the dm₂ presents a moderate-sized, rectangular and somewhat flattened contact facet. On the Ldm₂ this facet measures 3,5 mm in breadth and 2,3 mm in height.

The mesial marginal ridge is relatively thick and courses round from in front of the protoconid to the mesial end of the metaconid. It is thicker buccally than lingually, where, mesial to the metaconid, it is considerably thinner. Nevertheless, the mesial marginal ridge is continuous around the front of the

tooth; it is not incised. Though the region is worn, it appears that a small plesioconulid might have been present mesial of the tip of the protoconid. The fovea anterior is represented by a short, relatively deep, transverse groove which is enclosed completely by the mesial marginal ridge and a continuous, high and moderately thick crest between the metaconid and protoconid. A broad contact is present between the metaconid and hypoconid, and the buccal groove is more mesial than the lingual groove.

The lingual surface is slightly convex occlusocervically with a faint cervical enamel prominence present. The lingual groove is faint and fades imperceptibly approximately half-way down this face.

The buccal surface over the hypoconid is rather bulbous in appearance and is moderately to markedly convex occlusocervically. A slight cervical enamel prominence is present. This face of the protoconid is convex over the cervical half, the occlusal half is somewhat flattened and slopes outwards cervically from the protoconid tip. A faintly developed tuberculum molare is present; the cervical portion of the protoconid surface projects slightly laterally and the cervical enamel line dips below the level of this margin on the hypoconid. The buccal groove is rather narrow, but relatively deep. It courses vertically to end abruptly about half-way down this surface.

A small area of hypoplastic enamel is present on the buccal surface of the protoconid, just mesial to the buccal groove.

The principal dimensions of the crown are as follows:

	MD diameter (as measured)	MD diameter (corrected)	BL trigonid (as measured)	BL talonid (as measured)
Rdm ₁	9,4 mm	10,0 mm	7,5 mm	8,1 mm

The radicular system comprises broad mesial and distal root plates and a very low neck. The two plates are directed almost vertically downward, expanding buccolingually towards their apical ends, and each has two separate radicular canals. The apical third of each root plate is bifid.

The apical ends of the mesial and distal radicae of the left tooth are separated on the buccal side by some 7,3 mm. The mesial root plate of the left tooth measures approximately 6,5 mm buccolingually at the cervical margin and 9,2 mm at the apical end. The distance from the cervical line to the buccal apex of the mesial plate is about 8,8 mm, and the lingual side of the plate measures some 9,3 mm in length.

Mandibular second deciduous molars

The left and right teeth are present. The left crown and root system are more complete than those of the right. The cervical half of the buccal surface and the upper part of the root of the left tooth are broken away.

On the right tooth most of the protoconid and hypoconid have been broken away, together with much of the distal root plate. Both crowns show several fine cracks which course across the surfaces in various directions; the

right tooth has been affected by this cracking more than the left. In so far as they are preserved, the crowns are nearly identical in morphological detail.

Viewed from the occlusal aspect, the crown is rectangular in outline. The five principal cusps are present and well developed. The metaconid is by far the largest cusp with the hypoconid, protoconid and entoconid nearly equal in size. The hypoconulid is, by a slim margin, the smallest cusp. In general, the cusps are rather bulbous in appearance, with narrow and nearly vertically sided grooves separating them.

Occlusal wear is slight, with all cusps showing enamel wear, though this is slightest on the entoconid. The other cusps have been reduced in height somewhat and they show flattened occlusal surfaces. The buccal cusps have been worn slightly more heavily than the lingual cusps. The tops of the protoconid, hypoconid, and hypoconulid are worn to a nearly flat, horizontal plane. Except for a small pit of dentine on the protoconid, there is no dentine exposure despite the reduction in cuspal height. Interproximal attrition with the dm_1 , as noted above, is slight, and there is no contact distally with the M_1 .

The mesial marginal ridge of the dm_2 is very thick and, though worn, it appears to have been relatively high. It continues uninterrupted from in front of the metaconid across to the protoconid. Behind this ridge the fovea anterior is represented by an H-shaped groove. The mesial transverse groove is narrow and relatively shallow, and it is incompletely enclosed behind by short, accessory transverse crests from the metaconid and protoconid. A short, narrow longitudinal groove separates these two crests. The distal transverse groove is somewhat longer, broader and deeper than the mesial groove, and it is completely enclosed behind by a very thick, continuous ridge between the back of the protoconid and the principal crest of the metaconid. The metaconid displays a broad contact with the hypoconid; the two buccal grooves, which surround the hypoconid, and the lingual groove, between the metaconid and entoconid, are arranged in a symmetrical Y-shaped pattern. The mesiobuccal developmental groove is thus situated mesiad of the level of the lingual groove. The distal marginal ridge is relatively thick and is uninterrupted in its course. This ridge is slightly worn but it is apparent that it supported a tiny accessory cusplid (the tuberculum sextum) which is represented solely by a faint convexity of the distal crown surface. The cusplid, despite its small size on the left tooth, is even smaller and more weakly expressed on the right crown. The fovea posterior is represented by a relatively deep but narrow crescent-shaped groove which is continuous with the talonid basin via a deep, narrow groove between the hypoconulid and entoconid.

The buccal surface has suffered damage. However, it is evident that the mesiobuccal groove was better developed than the distobuccal groove. The distal groove is relatively deep but narrow, and extends vertically for about one-third of the crown height where it terminates rather abruptly.

The lingual surface is somewhat inflated in appearance. It is slightly convex occlusocervically with a slight cervical enamel prominence at the base of the

metaconid and a rather marked prominence at the base of the entoconid. The enamel line continues round underneath the crown for a short distance between the mesial and distal radicularae. The lingual groove is of moderate depth but narrow, and continues vertically to the cervical margin. Over the lower third of its course it is bifid, with a faint accessory groove running parallel to it mesially. The distal half of the metaconid surface displays a number of minute hypoplastic pits, and these are more numerous and marked near the lingual groove.

	MD diameter (as measured)	BL trigonid (as measured)	BL talonid (as measured)
Ldm ₂	12,2 mm	9,7+ mm	9,8+ mm
Rdm ₂	12,4 mm	—	—

The buccolingual diameters recorded here are minimum values; because of the damage the buccal surface has suffered, it is not possible to estimate accurately the original dimensions of the trigonid and talonid portions of the crown.

The root system of the second deciduous molar comprises broad mesial and distal radicular plates and a very low neck. Because of damage to the cervical region, the breadth of the plates cannot be measured accurately. The plates appear to diverge slightly as they course downward. The length of the buccal side of the mesial plate of the left tooth measures at least 10,5 mm.

Permanent dentition (Figs 8–9)

Mandibular central permanent incisor

The isolated crown of the left central incisor is present. The crown is complete and well preserved. A very short segment of the developing root is represented on the mesial and distal aspects of the tooth. The tooth had not yet erupted at the time of death.

The mesial and distal corners of the incisal edge are slightly rounded. A large, high mammelon is supported at either extremity, with a much lower tubercle between the mesial and distal mammelons.

Viewed from the buccal aspect, the crown has a high, tapered outline; the mesiodistal diameter is considerably greater incisally than cervically. The buccal surface is slightly convex incisocervically and a cervical enamel prominence is not present. Numerous faint, horizontal, perikymatous lines cover this face entirely.

Lingually, a moderate basal prominence is present. A tubercular structure is not supported by this swollen base. The basal prominence is symmetrically orientated. The mesial marginal ridge is thin and very faintly expressed; the distal marginal ridge is slightly better developed. The lingual surface is flattened.

	MD diameter (as measured)	BL diameter (as measured)	Height (as measured)
LI ₁	5,1 mm	5,7 mm	10,0 mm

Mandibular lateral permanent incisor

The isolated crown of the left tooth is present. The crown is well preserved and nearly complete, with only slight enamel loss to the buccal cervical margin and somewhat more severe damage to the base of the lingual side. The developing root is represented by short segments on the mesial and distal aspects of the tooth. The tooth had not yet erupted at the time of death.

The crown is somewhat more robust in appearance than that of the central incisor. The mesial and distal corners of the incisal edge appear rather sharply angulated with the mammelons at these extremities. The incisal edge is, in general, horizontal, and it supports five small mammelons.

Viewed from the buccal aspect, the crown is somewhat rectangular in outline. The mesiodistal breadth across the incisal portion is greater than that

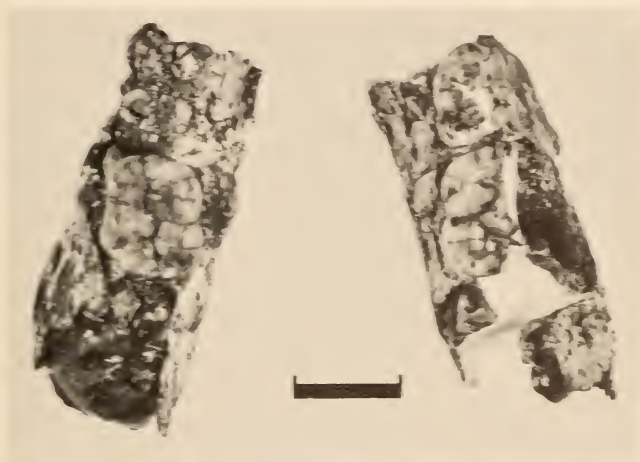


Fig. 8. Occlusal view of the mandibular corpora and dentition of SK 852 in approximate anatomical alignment. Scale in cm.



Fig. 9. Lingual view of the LC, LI₂, LI₁ and Rd₂ (from left to right) of SK 852. Scale in cm.

across the cervical region of the crown, but the relative difference between these measurements is not so marked as in the central incisor. The buccal surface is slightly convex incisocervically. Very faint perikymatous lines and a broad but shallow groove are present on this face.

Although the cervical extremity of the lingual surface has been damaged, it is evident that a slight to moderate basal prominence was present. The basal swelling does not show tubercles. The mesial marginal ridge is slightly developed; the distal marginal ridge is more faintly expressed than the mesial. Between these ridges, the lingual surface is faintly concave both mesiodistally and incisocervically.

	MD diameter (as measured)	BL diameter (corrected)	Height (as measured)
LI ₂	5.6 mm	6.4 mm	9.9 mm

Mandibular permanent canine

The isolated crown of the left mandibular canine is well preserved and is nearly complete. The lingual cervical enamel margin has suffered only slightly from damage. Mesially, a short, thin sheet of the developing root is present, but this is not represented on any other part of the tooth. The tooth had not yet erupted at the time of death.

Viewed from the buccal aspect, the crown is nearly square in appearance; the mesial corner of the tip is slightly rounded, while the distal portion slopes downward for about half of the crown's height from just behind the centre of the crown. The tip of the tooth is obtuse; mesially this surface is nearly horizontal. The buccal surface is slightly convex occlusocervically as well as mesiodistally. No evidence of enamel pathology is shown on this face.

Lingually, the cervical prominence is moderate and symmetrical. Lingual tubercles are not present. The mesial marginal ridge is faintly expressed; it appears as a low, thin band coursing round from the occlusal surface of the crown for approximately half of the crown height, where it blends imperceptibly with the basal swelling. The distal marginal ridge is moderate; it originates occlusally approximately in the middle of the distal slope of the crown. This ridge becomes thickened towards the cervical prominence. A thin, low, vertical enamel ridge is situated mesiad of the distal marginal ridge, and this vertical crest originates at the cervical edge and continues cervically for just less than half of the crown height. The 'median' and distal marginal ridges are separated by a depression which is broader and relatively shallow occlusally, but which becomes increasingly narrower and deeper as it passes cervically, where it partially separates the distal ridge from the cervical swelling. The lingual surface is, for the most part, rather flat.

	MD diameter (as measured)	BL diameter (as measured)	Height (as measured)
LC.....	7.3 mm	8.1 mm	9.0 mm

Mandibular first permanent molar

The left crown is well preserved and complete. It is situated in its crypt and, except for the occlusal surface, only the distal surface and the posterior half of the buccal face are exposed. A narrow crack courses across the tip of the hypoconulid and continues vertically over the distal surface; slight enamel displacement has occurred along this crack. The root is represented by a relatively short sheet below the cervical margin, and it is evident that the mesial and distal root plates had begun development at the time of death. The right tooth is represented by a portion of the metaconid and a second piece of the crown containing parts of the hypoconid and hypoconulid. The remainder of the right crown is missing.

Viewed from the occlusal aspect, the crown appears to have a rectangular outline. All five principal cusps are present and are well developed. The metaconid seems to be the largest cusp, followed in decreasing order of size by the protoconid, entoconid, hypoconid, and hypoconulid.

The mesial marginal ridge has been damaged slightly but it appears to have been moderately well developed, thick and continuous. Distal to it, the fovea anterior is represented by a relatively short, but deep, transverse groove. The fovea is drained distally by a very narrow, but deep, groove between the protoconid and metaconid. An 'accessory' anterior fovea, as presented by the dm_2 , is not shown by this tooth. The principal crest of the metaconid has a short, distally deflected ridge (a deflecting wrinkle) which contacts the hypoconid. The metaconid is more distally elongate than the protoconid. The lingual developmental groove is situated distad to the mesiobuccal groove—and thus the primary occlusal fissure pattern is symmetrically Y-shaped. The distal marginal ridge is represented by a small cuspid (the tuberculum sextum) which is demarcated from the hypoconulid and entoconid by shallow, narrow grooves. The fovea posterior is in the form of a small but relatively deep pit. A narrow groove between the entoconid and hypoconulid connects the fovea posterior with the distobuccal groove.

The posterior part of the buccal surface is slightly convex occlusocervically, and the distobuccal groove is deep but short. It courses vertically for slightly more than a third of the crown height, where it ends in a pit.

The dimensions of this crown cannot be determined accurately.

SPECIMENS SK 839/SK 852 COMPOSITE

The right first and second maxillary deciduous molars of SK 839 and the right first and second deciduous mandibular molars of SK 852 provide a contact between these two specimens. The occlusal relationships between both the first and second deciduous molars are very good (Fig. 10), and they are very similar in their general state of wear. Casts were made of the upper and lower second deciduous molars with the materials and according to the techniques described by Grine (1977). The occlusal surfaces of the casts were examined by scanning

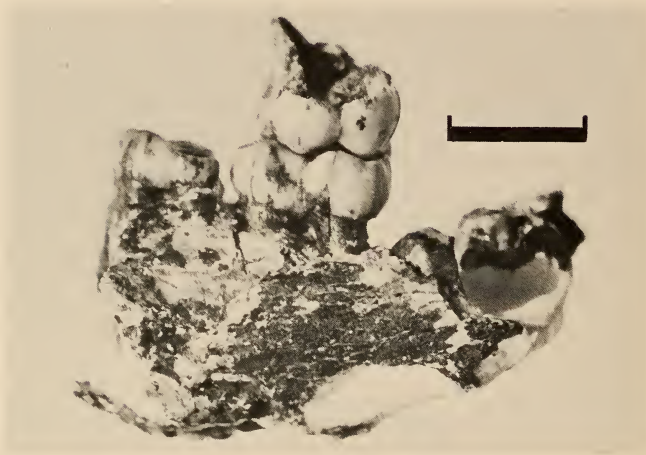


Fig. 10. Lingual view of the occlusal relationship between the Rdm^2 of SK 839 and the Rdm_2 of SK 852. Scale in cm.

electron microscopy. The types, degree, and orientation of the abrasive scratches on the two teeth were found to be very similar.

Also, the permanent teeth of the two specimens display degrees of calcification that are compatible with their having belonged to the same individual. The states of preservation of these fossils, for example the manganese staining patterns of the teeth, are also similar.

These findings support Wallace's (1972, 1973, 1978) suggestion that SK 839 and SK 852 represent the maxillary and mandibular remains of a single juvenile individual.

SPECIMEN SK 1595

This specimen was recovered from the Member 1 breccia during the 1948–52 operations at Swartkrans. It was discovered in 1966 amongst a number of supposedly non-hominid faunal remains by C. K. Brain, who performed some preliminary preparation on it. The description on the catalogue card reads, 'Fragment of maxilla with a slightly worn M^1 left and an erupting incisor?'

Prior to cleaning and restoration, this specimen consisted of a damaged left upper molar, the tip of a permanent lateral incisor and a small piece of what appeared to be the incisal edge of an incisor (Fig. 11). Also, a narrow, thin sheet of maxillary alveolar bone was present round the incisors, and at the back of the specimen the outline of what appeared to be part of an upper molar crown was visible in the matrix.

Preparation revealed a very badly damaged and fragmented LI^1 (Figs 12–13), much of the crown of the LI^2 (Fig. 12), the mesial part of what is here considered to be the LM^1 (Fig. 14), and the distal moiety of what is here believed to be a slightly worn Ldm^2 (Fig. 14).

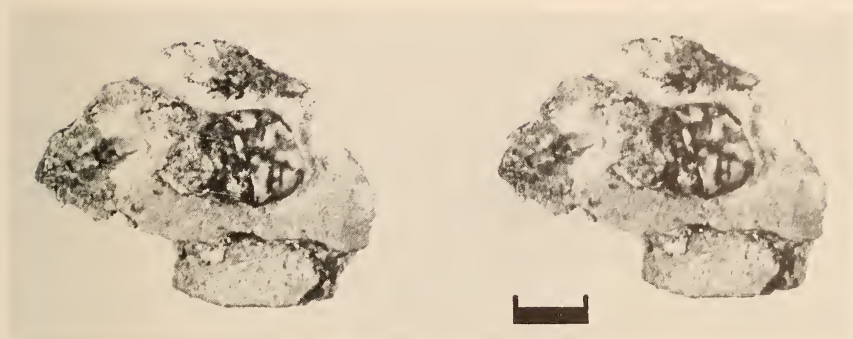


Fig. 11. Stereoview of SK 1595 prior to preparation. Compare with Figures 12-14. Scale in cm.

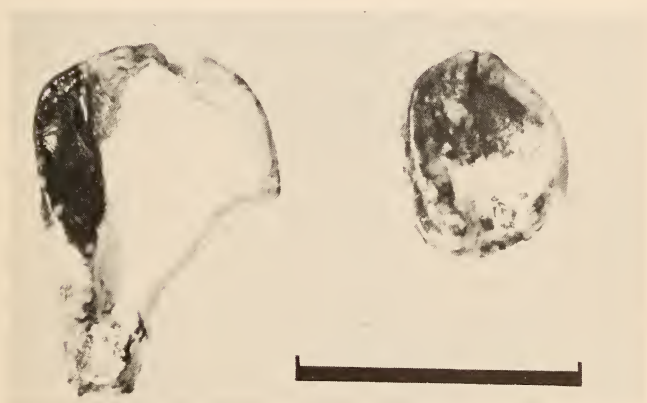


Fig. 12. Lingual view of LI¹ and LI² of SK 1595. Scale in cm.

Deciduous dentition (Fig. 14)

Maxillary second deciduous molar

The distal half or more of the crown of the left second deciduous molar is present. The mesial portion of the crown has been broken away along an uneven transverse line which courses through the middle of the protocone lingually, across the distal edge of the paracone buccally. Nothing of the radicular system remains.

It is evident that all four principal cusps were present originally, and it is probable that all were well developed. The metacone and hypocone are both well developed and they are nearly equal in size.

Occlusal wear is slight on the preserved part of the crown. The protocone is the most heavily worn cusp; it has been reduced in height more than the two distal cusps, and it shows a large, faintly convex enamel facet. The hypocone



Fig. 13. Buccal view of LI¹ of SK 1595.
Scale in cm.



Fig. 14. Occlusal view of the Ldm² and the mesial
portion of the LM¹ of SK 1595. Scale in cm.

displays a large, flattened enamel facet which slopes downwards mesiobuccally. The metacone shows the lightest wear of the three cusps, with only a small enamel facet. Dentine is not exposed. An interproximal attrition facet is not present on the distal surface of the crown.

Occlusally, the distal trigon crest is moderately thick but it is incised on its mesial and distal surfaces by a shallow groove. The distal marginal ridge is thick and complete. It is somewhat lower in its middle but is continuous high on to the distal aspect of the metacone. Four small cuspules are supported by this ridge; each cuspule is only faintly demarcated. The talon basin is relatively large and deep. A deep, narrow, longitudinal groove drains this basin near the middle of its mesial aspect, and this groove is continuous with the deep, narrow lingual groove between the protocone and hypocone.

The lingual surface over the hypocone is moderately convex occlusocervically and, although the cervical margin is damaged, it appears that a cervical enamel prominence was present. The lingual groove is relatively deep but narrow, and it courses vertically to the cervical margin. Approximately two-thirds of the way down the crown the groove is interrupted by a narrow (1,5 mm thick), horizontal enamel band.

Buccally, the surface is more swollen in appearance than the lingual. The face of the metacone is moderately convex occlusocervically. The buccal groove is rather deep and somewhat broader than the lingual. It continues vertically for about half of the crown height, where it ends abruptly in a deep pit. The pit is surrounded buccally by a thin, continuous enamel crest from the paracone to the metacone. Near the distal side of the metacone a short, shallow and narrow, vertical groove courses from the occlusal margin. This groove partially demarcates the most buccal of the distal cuspule (= distostyle) from the main body of the metacone. A few minute hypoplastic pits are shown on the mesiobuccal surface of the metacone, near the occlusal margin of this surface. Some hypoplastic mottling is present also on the distal surface of the crown.

The mesiodistal diameter of this crown is estimated to have been between 11,2 and 11,4 mm. The buccolingual diameter measured across the distal parts of paracone and protocone is some 12,5 mm, the original dimension is judged to have been perhaps another 0,2 mm greater.

	MD diameter (estimated)	BL diameter (as measured)	BL diameter (estimated)
Ldm ²	11,3 mm	12,5 mm	12,7 mm

Permanent dentition (Figs 12–14)

Maxillary central permanent incisor

The incomplete, isolated crown of the left maxillary incisor is represented. The crown, as preserved, was reconstructed from seven different fragments. Most of the lingual surface is missing, save for the mesial marginal ridge and a narrow bit of the incisodistal edge. The mesial surface is nearly complete, but

the cervical region is damaged. The buccal face is only slightly more complete than the lingual, where the mesial and incisal parts are present.

The crown is unworn and probably had not yet erupted—at least it had not yet reached occlusion—at the time of death.

The mesial corner of the incisal edge is squared off, with the incisal and mesial edges meeting at just slightly more than 90°. The distal corner is considerably more rounded than the mesial. The incisal edge appears gently curved mesiodistally. This edge is faintly scalloped, and the mesial part supports two broad, low mammelons.

Viewed from the buccal aspect, the crown appears to have been rather square in outline; its mesiodistal diameter is judged to have been only slightly less cervically than incisally. The buccal face is slightly convex incisocervically. Fine perikymatous lines are visible over much of the preserved surface.

Lingually, the mesial marginal ridge is only slightly developed. It is extremely thin and low incisally, and expands somewhat as it courses cervically.

	MD diameter (as measured)	BL diameter	Height
LI ¹	9,0 mm	—	—

Maxillary lateral permanent incisor

The left maxillary lateral incisor is represented by an isolated, somewhat damaged crown. The cervical region round the entire periphery of the crown has suffered enamel loss, this being heaviest distobuccally and lingually. The crown appears to be fully, or nearly fully, developed, and it is relatively small, especially when compared to the I¹.

The tip of the crown is surmounted by two small mammelon-like tubercles. Mesial to the tip, the occlusal edge courses only slightly downward to the mesial corner, which is rather strongly curved. The edge distal to the tubercles slopes cervically much more strongly, and the distal 'corner' is broadly rounded and lower than the mesial.

Viewed from the buccal aspect, the crown is almost square in general outline, but with the distal occlusal 'corner' reduced. The buccal surface is faintly convex occlusocervically and there is no evidence of either perikymatous or hypoplastic enamel.

Lingually, the cervical region is damaged; the presence, or otherwise, of the basal prominence cannot be determined. There is no evidence of the existence of lingual basal tubercles. Both the mesial and distal marginal ridges are faintly developed; they course round the periphery of the lingual face from the tip as thin, low enamel ridges. Towards the cervical margin, however, these ridges become slightly more prominent. The lingual surface is flat.

	MD diameter (as measured)	BL diameter	Height
LI ²	6,2 mm	—	—

Maxillary first permanent molar

The left molar is represented by the damaged mesial portion of the crown. This piece consists of much of the mesial surface, the lingual part of the paracone, the entire mesial marginal ridge, and the mesial part of the protocone. The preserved part of the crown is unworn and the tooth is judged to have been unerupted at the time of death.

The mesial marginal ridge is moderately thick and high. It is continuous, but is incised by two shallow grooves at the base of the tip of the paracone. A small cuspule (= epiconule) is demarcated by these grooves. The crest is expanded distally in its middle, and a small pit is situated atop it in this position. The fovea anterior is represented by an elongate, irregular and narrow transverse groove; it is broadest in front of the paracone. The protocone and paracone are separated by a relatively deep, broad groove by which the fovea anterior appears to be continuous with the trigon basin.

Measurements are not possible.

SPECIMEN SK 2147 (Fig. 15)

There is no catalogue card for this specimen. It was discovered in the collection, labelled as an isolated lower premolar; it is, in fact, an isolated, incomplete Ldm¹.

Prior to preparation, the crown sat atop, and was partially covered by, a small piece of typical 'Pink', or Member 1, Swartkrans breccia.

The specimen consists of the mesial two-thirds of a moderately worn crown, with much of the mesiobuccal root present. The distal part of the crown has been broken away along an irregular transverse line which cuts through the distal edge of the protocone, and through the lingual extent of the metacone where it turns sharply mesially to the posterior extent of the paracone. The crack extends directly lingually from this point along the plane occupied by the lingual developmental groove. Several narrow cracks traverse the protocone and the paracone. The cervical portion of the buccal surface is cracked, with considerable displacement of two rather large pieces of enamel. The mesial face of the crown has suffered slight enamel loss and cracking. A narrow horizontal crack traverses the mesial surface of the mesiobuccal root, and the tip of the lingual part of this root has been damaged near its apex.

The occlusal outline of the crown cannot be determined. The protocone is a very large cusp; the paracone is well developed also, but considerably smaller than the protocone. Mesial to the paracone a large mesiostyle (= parastyle or paraconule) is present. The mesiostyle is separated from the paracone by a relatively deep, broad groove.

Occlusal wear is moderate. The protocone has been reduced considerably in height, with a large, nearly flat and slightly lingually sloping enamel facet. A large, elongate and ovoid-shaped, concave dentine exposure is present in the middle of the protocone. The buccal side of the crown is less heavily worn; the

paracone, mesiostyle and mesial marginal ridge all show enamel wear. A small island of dentine is exposed on the tip of the paracone.

Interproximal attrition, at least mesially, appears to have been moderate. A large, slightly concave facet for the d^c is present at the buccal extremity of the mesial surface, it measures 2,8 mm buccolingually and 2,5 mm in height.

Occlusally (Fig. 15), the mesial marginal ridge is well developed. It is thick and relatively high, and extends continuously from the mesiostyle to the mesiolingual aspect of the protocone. The fovea anterior is represented by a

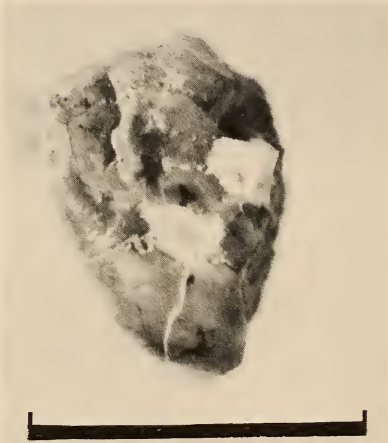


Fig. 15. Occlusal view of SK 2147 Ldm¹.
Scale in cm.

relatively deep, broad groove which is continuous with the incision between the paracone and mesiostyle. The fovea is enclosed distally by a high, moderately thick enamel crest between the anterior part of the paracone and the protocone. The trigon basin is represented by a relatively deep and broad λ -shaped groove. The tines of the λ encompass part of the buccal aspect of the protocone between this cusp and the paracone and metacone. The stem of the λ has been damaged, but it is evident that it represented the buccal developmental groove between the paracone and metacone.

The lingual surface of the protocone is slightly convex occlusocervically and a slight cervical enamel prominence is shown.

The cervical portion of the buccal surface has been damaged, but this portion was seemingly less convex than the lingual face, with a slight cervical enamel prominence. The occlusal two-thirds of the buccal face is relatively flat. The buccal groove is missing. A faint groove courses vertically for a short distance from the occlusal incision between the paracone and the mesiostyle. It is apparent that there was no tuberculum molare over the mesiocervical aspect of the buccal surface.

	MD diameter	BL diameter (as measured)	BL diameter (corrected)
Ldm ¹	—	9,8 mm	10,0 mm

The mesiobuccal root has a flattened, ovoid outline in cross-section; it is expanded buccolingually and compressed mesiodistally. The long axis of the root, in cross-section, runs slightly mesiobuccally-distolingually. The buccolingual diameter measures some 5,3 mm and the mesiodistal some 3,9 mm at the cervical margin. The root is relatively straight, and it courses rather markedly mesially from the cervical line to its tip. It diverges buccally somewhat. This root is estimated to have been approximately 8,5 mm long.

DISCUSSION

Four specimens representing the jaws and/or teeth of some three juvenile hominid individuals from Swartkrans have been prepared and described in detail. The remains are all derived from Member 1 breccia. These specimens have added a number of deciduous and permanent teeth to the already sizeable collection from this site.

Robinson (1956) referred one of these specimens (SK 839) to *Paranthropus robustus*. Wallace (1972) suggested that SK 839 and SK 852 represent a single individual, and he included this composite in his hypodigm of *Australopithecus robustus* from Swartkrans. The results of the present study support Wallace's suggestion that SK 839 and SK 852 belonged to a single individual. SK 1595 was also referred to *A. robustus* by Wallace (1972) on the basis of the occlusal wear pattern exhibited by the dm².

The fourth specimen, SK 2147, was catalogued as an isolated permanent premolar. The author considers this tooth to be a left dm¹, and as such it represents, to date, the second specimen of this tooth found at Swartkrans. The other dm¹, SK 91, has been referred by both Robinson (1956) and Wallace (1972) to the 'robust' australopithecine taxon. The morphology shown by SK 2147 is similar to that evinced by SK 91, and the dm¹ of SK 2147 is also referred to the Swartkrans 'robust' australopithecine taxon.

An analysis of the morphological and metrical data available for the collection of deciduous and permanent teeth from Swartkrans is beyond the scope of the present paper and will be presented elsewhere.

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